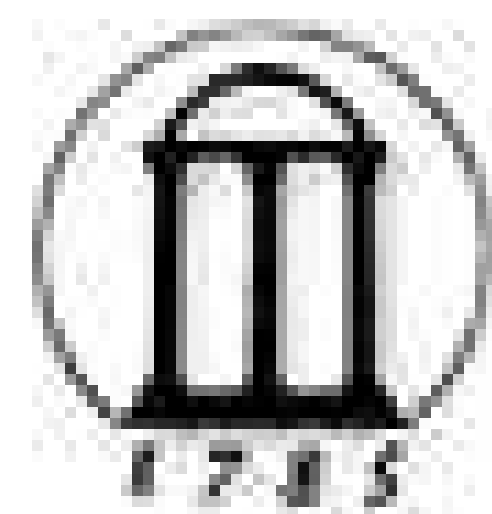J.

Identifying Management Practices which Reduce Costly Losses of Soil, Water and Nutrients

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Interests

Sustainable practices should help the producer economically, while reducing the risk of drought and environmental degradation.

Increasing nutrient and water use efficiencies by improving soil quality.

Decreasing nutrient losses to aquatic systems and the atmosphere.

Management systems which better utilize and retain nutrients must be identified.

We must conserve our soil and water resources.
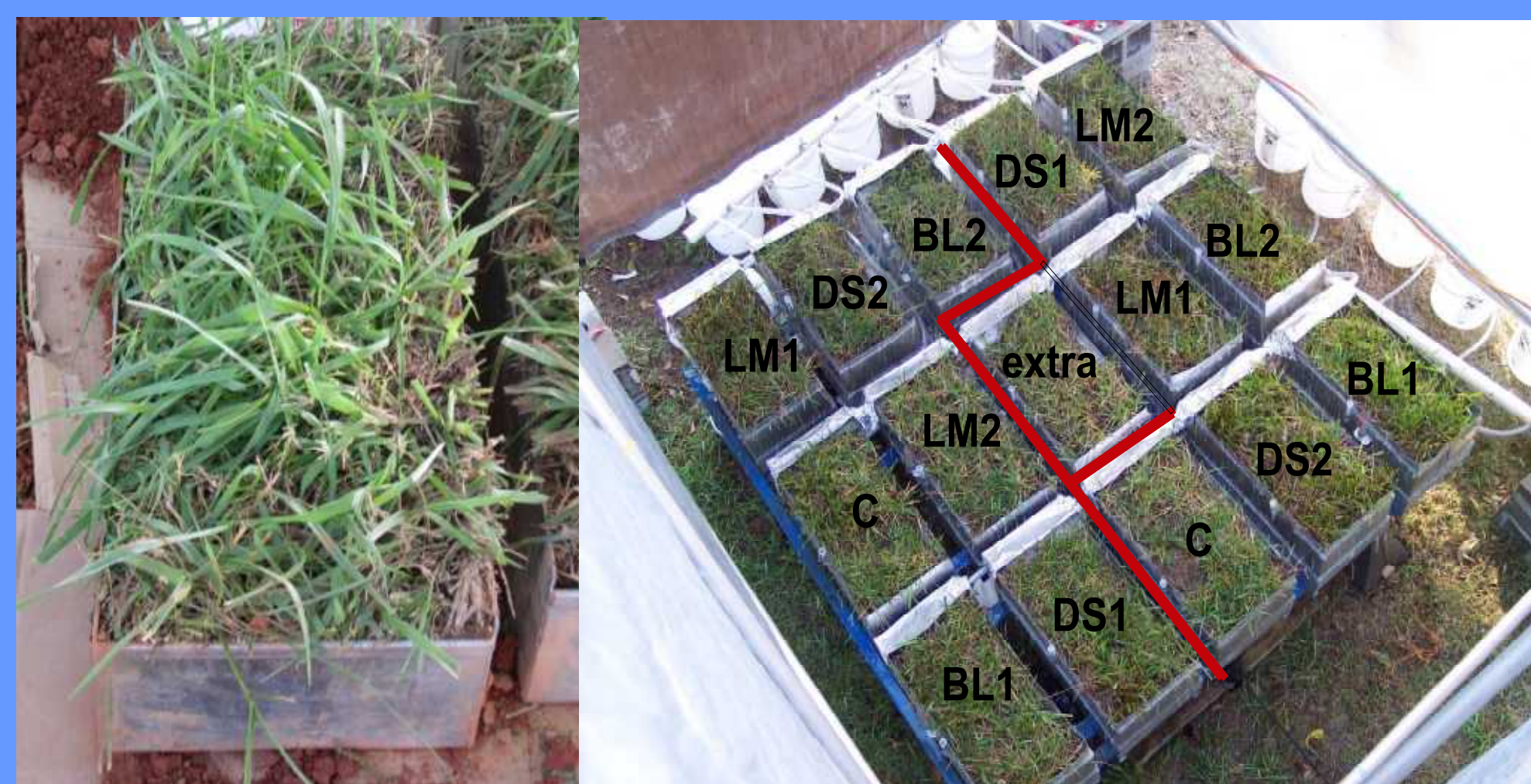
Objectives

Determine effect of dairy slurry, broiler litter, and layer manure on nutrient movement within the soil and on nutrient losses from multiple scales (soil boxes, microplots, field-scale, and watershed scale).

Determine effect of gypsum on percent rainfall infiltration and phosphorus deposition in the soil.

Determine effect of percent ground cover on nutrient and sediment losses from riparian pastures with cattle feces and urine present.

Determine which P forms (dissolved or particulate) are most susceptible to runoff losses for incorporated and non-incorporated animal manures.

Determine effectivenss of different implements (disking, kniffing, spiking, or coring) in reducing the loss of soil, water, and nutrients.
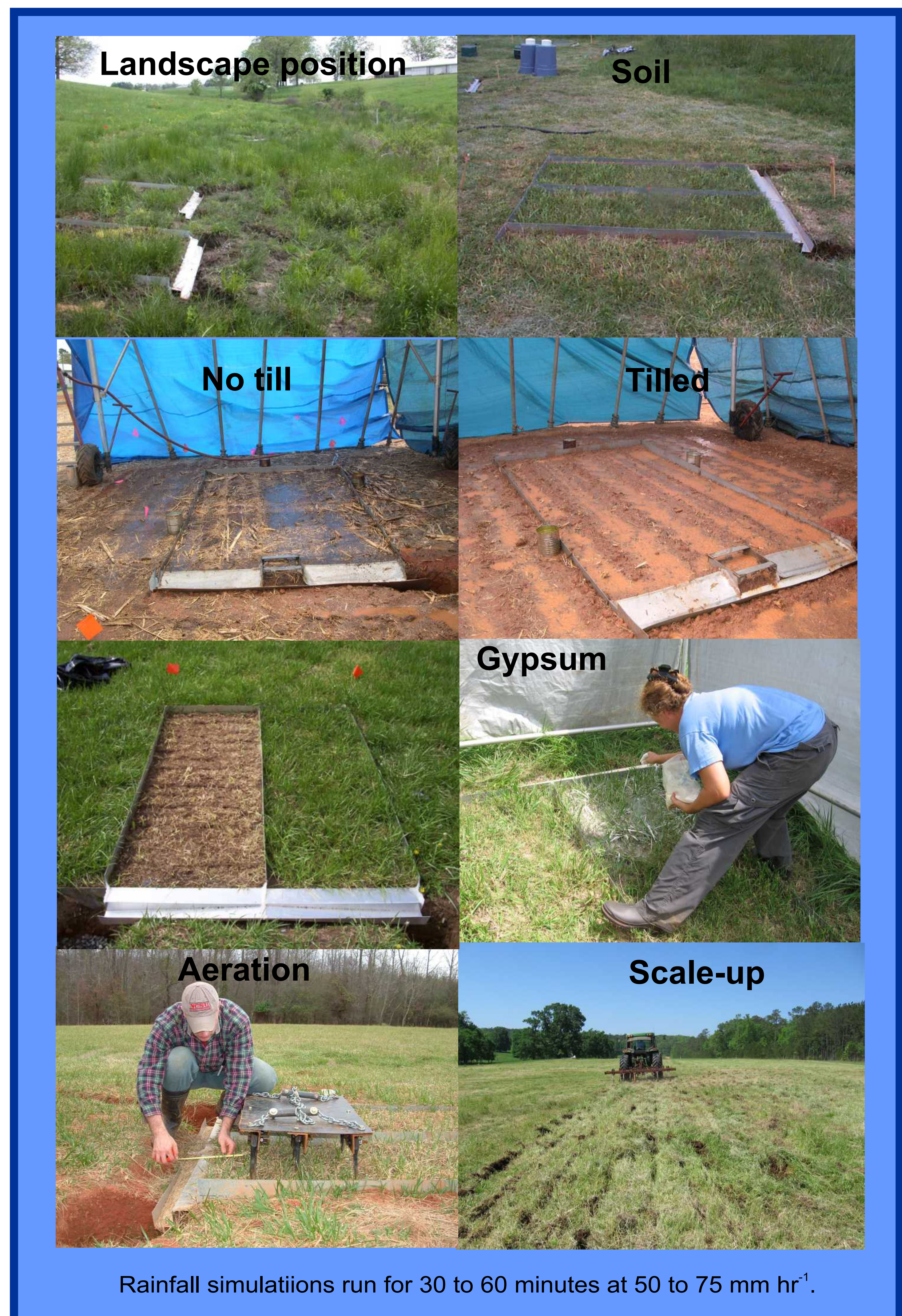
LM: Layer manure, BL: Broiler litter, DS: Dairy slurry

Landscape position **Soil**

No till **Tilled**

Gypsum

Aeration **Scale-up**

Rainfall simulatiions run for 30 to 60 minutes at 50 to 75 mm hr^{-1}.

Results

Microplots fertilized with triple super phosphate lost more dissolved reactive P ($p < .01$) than microplots fertilized with broiler litter.

Spike aeration reduced cumulative runoff 28% ($p < .15$) regardless of fertilization treatment or landscape position.

Runoff volume and phosphorus losses were significantly lower ($p < .05$) in the footslope position.

Dissolved P and Particulate P were reduced by at least 31 and 82%, respectively with 45% to 95% cover.

Elevated ammonium runoff losses during rainfall simulations involving application of feces and urine

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